THE UNIVERSITY OF TEXAS BULLETIN
No. 3618: May 8, 1936

THE CORNER-TANG FLINT ARTIFACTS OF TEXAS

By

J. T. PATTERSON
Professor of Zoology

Bureau of Research in the Social Sciences
Study No. 18

Anthropological Papers, Vol. I, No. 4

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The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of Democracy, and while guided and controlled by virtue, the noblest attribute of man. It is the only dictator that freemen acknowledge, and the only security which freemen desire.

Mirabeau B. Lamar

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FOREWORD

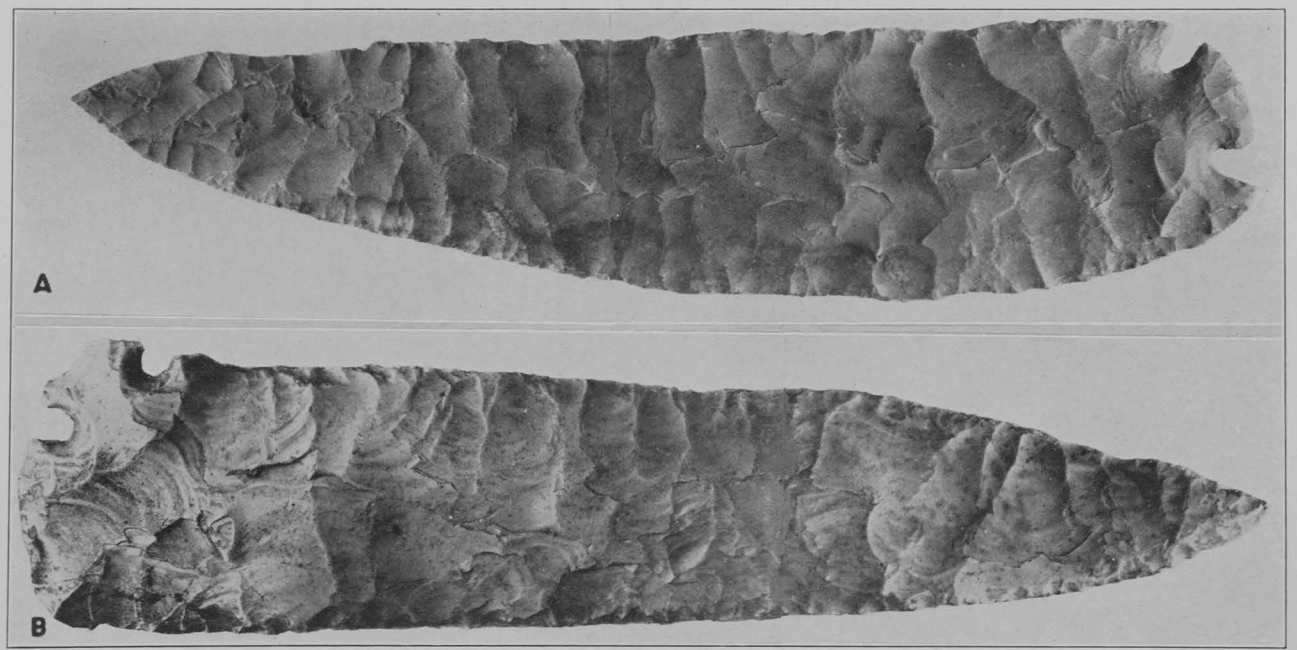
It is fortunate for those who have any special interest in Texas archaeology and its problems that Dr. J. T. Patterson of the Zoology Department of The University of Texas has been induced to write this paper dealing with one of the four or five unique and characteristic flint implements of Central Texas.

Dr. Patterson's high abilities as a research worker in his own field of biology assures one of exhaustive scientific treatment of any theme with which he attempts to deal. This study represents a profound interest on his part in a field that is to him a second love; namely, archaeology, his chief hobby. He had accumulated a considerable number of specimens of this very interesting and elsewhere unknown implement before he decided to undertake to delimit the area in which it is found and to get definite information about as many as possible of the specimens now in the hands of collectors. To this end he has devoted, as his map will show, no small amount of energy and time.

As a consequence this paper represents the last word upon this implement and the area in which it is found, except as the area itself may be extended to the south by further investigation and perhaps as to levels in which the knives may be found within the Central Texas field. As to this matter of the culture levels to which this unique knife belongs, any information that I have at the present time would indicate that his conclusions are correct.

The relative scarcity of these blades, together with the variety of forms found among them, would indicate two facts: one, that they belong to a relatively early period and had once been more numerous than their presence in the middens and on the surface would now imply; and, two, that they had been picked up by later peoples who did not make them but who retouched them, transformed them into drills and otherwise used them up to such an extent as to account for their relative scarcity. We are fortunate in having this highly interesting specimen disposed of for the archaeological world by one whose competence is beyond question and the Anthropology Department of The University of Texas is grateful to Dr. Patterson for producing this paper and permitting it to appear as one of the series of Anthropological Papers of the University.

J. E. PEARCE.



A, Seven and one-half inch curved knife found in gravel pit near Deatsville, Travis County. × 7/8. Gilbert Searight, Austin; B, Eight-inch diagonal corner-tang knife found in 1928 on Hickory Creek, Llano County, by Mr. Obed Rode. × 7/8. No. 6425.

THE CORNER-TANG FLINT ARTIFACTS OF TEXAS

By J. T. PATTERSON

INTRODUCTION

In 1897 Thomas Wilson (fig. 19, Plate 39) in his paper on "Arrowpoints, Spearheads, and Knives of Prehistoric Times" illustrated by a photograph a corner-tang knife from San Saba County, Texas. Wilson does not comment on this specimen in the text, other than to list it among the "curious forms" under his scheme of classification for flint artifacts. In 1910 W. K. Moorehead (p. 159, Vol. 1) figured and briefly described a broken specimen found in a collection in Colorado. The piece described by Moorehead had a very weak tang, and this lead him to suggest that the hafted knife must have been used for cutting soft meat, like that of fish. This suggestion undoubtedly constitutes the source of the term "fish knife," which is one of the common names applied to these pieces. Some of the more recent references to corner-tang pieces are to be found in articles by Pearce and Jackson (1933), Ray (1935), and Huskey (1935). All of the above references are more or less incidental, and no adequate account has so far appeared.

The striking characteristics of these stone objects attracted attention from the time of their first discovery, and gave rise to a number of questions which have not been satisfactorily answered. While the main object of this paper is to describe and to illustrate the several types of corner-tang pieces, and to indicate their general distribution in Texas, yet an effort will be made to answer some of the questions which were raised by their discovery.

For the past four years the writer has been interested in accumulating information on the occurrence of these artifacts in Texas. A large number of collections in the state have been examined and records have been made of all corner-tang pieces found. In addition to these, many other records have been obtained by sending letters to collectors living in different parts of the state, and asking them to report any corner-tang pieces in their possession. They were also requested to give the source of each piece, accompanied by an outline tracing made by drawing a line around the specimen.

As a result of these efforts, a total of 533 authentic records of corner-tang pieces has been obtained. The county sources of only seven of these are unknown. Of the total of 533, 383 have been seen and examined, and 118 others are represented by outline tracings, leaving thirty-two known only from reports from reliable persons. The writer has heard of several other specimens, but has not been able to trace them to the point where it seemed safe to include them among the authentic records. All specimens that were open to the suspicion of being spurious are likewise not considered.

Eighty-five of the 533 pieces are broken. Since many collectors discard broken or badly injured pieces, it is evident that were this not the case, the number of records would have been much higher. Fully half of the other flint artifacts found on the camp sites and in the mounds are broken or injured, and the corner-tang pieces should show about the same proportion between broken and perfect specimens. For the study of distribution and for the determination of the percentages of the different types of corner-tang artifacts, broken specimens are fully as important as perfect ones.

Types of Corner-Tang Pieces

From a careful study of the corner-tang specimens, it is possible to recognize at least six types or varieties. In the main, these depend for their distinguishing characteristics upon the exact position of the tang on the blade. The six types may be classified as follows: (1) the base corner-tang, (2) the diagonal corner-tang, (3) the back corner-tang, (4) the mid-back tang, (5) bifurcated and two-tang pieces, and (6) the reworked pieces, which usually take the form of drills. A full definition and description of each of these types is given below. Here, we are concerned only with the principle upon which this terminology is based. In the spearhead type of flint knife a "back" or non-cutting edge cannot be distinguished from a "front" or normal cutting edge, because the two edges bear the same relation to the tang. But once the tang is moved from the center of the base to one of the corners, the back and front edges can be distinguished from each other. In some of the corner-tang knives the two edges are worked equally well, but in a majority of the specimens examined, the front is

worked to a finer edge than the back, showing that it must have been intended as the principal cutting edge.

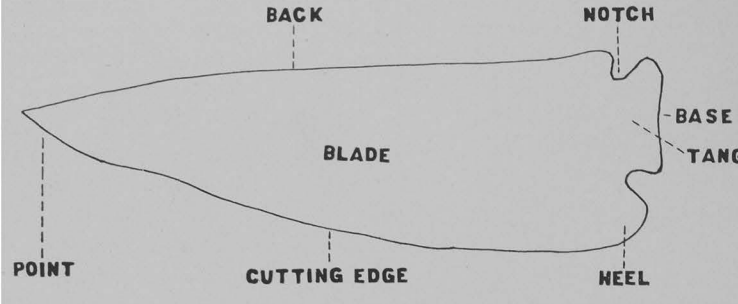
It should be pointed out that the classification suggested above is not rigid, for it is possible to find specimens which bridge the gap separating any two contiguous types. Thus, for example, it is possible to arrange a series of knives which show every gradation from the back corner-tang to the mid-back tang knife. Nevertheless, a large majority of the specimens fall into one or another of the types listed in the scheme of classification.

(1) *The Base Corner-tang Knife.*—The base corner-tang type will be considered first, because it gives a possible clue as to how the corner-tang pieces could have arisen among the Indian artisans. Since the presence of a tang on any flint artifact presupposes that the piece in use was fastened to a shaft or handle, the corner-tang knives must represent handled knives, as Moorehead (1910) first pointed out. It is well established that the American aborigines used the hafted spearhead as a two-edged knife (Wilson, 1897, Willoughby, 1902). It is reasonable to assume, then, that the corner-tang knife evolved from the spearhead type, and must have reached its final form through a series of modifications. If this is so, it should be possible to detect among tang-bearing flint knives some of the modified forms, which may be regarded as prototypes.

The spearhead type of knife, with the tang located in the middle of the base end, is not a convenient implement for certain types of work, such as that of skinning. The inherent difficulty in using the spearhead type is in part obviated by the use of the curved knife. It is therefore not surprising to find that many tang-bearing flint knives are either curved (fig. 1, Plate I), or else have the main cutting edge convex (fig. 2, Plate I). The same utilitarian advantage can be secured by placing the tang at or near one of the edges, rather than at the center of the base. In curved and convex knives the tang is sometimes slightly off center at the base, and along with this slight shift in the position of the tang is another change in structure of almost equal importance. The two "barbs" are frequently of unequal size, with the larger located at the normal cutting edge (Frontispiece A, and fig. 3, Plate I). Knives of this kind reveal what is undoubtedly the first indication of the development of the corner-tang type.

Figure 6 (Plate II) illustrates a simple type of tang-bearing flint knife that is sometimes found in Texas. In general form these knives are very much like the Solutréen, one-shouldered flint points from Dordogne, France, reported by Wilson (1897). This type of knife, however, is not a true corner-tang piece, because the angle of the haft with the blade has not been determined by the distinctive notching which is so characteristic of the corner-tang pieces.

In the typical base corner-tang knife (fig. 4, Plate I) the top of the tang is in line with the back edge of the blade, and its main axis parallels this edge. The relation of the various parts of the knife to one another is shown in Text-figure 1. The construction



Text-fig. 1. Outline tracing of a base corner-tang knife showing the various parts to which reference is made in the text.

of the tang near the upper or back edge in the base corner-tang knife results in the expansion of the lower barb into a distinct "heel," while the barb on the upper edge is either reduced in size, or else it is entirely absent. Variations in the base corner-tang type are illustrated in figures 7, 8 (Plate II), and 10 (Plate III).

In general the base corner-tang knives are easily classified, and usually do not overlap the next type or diagonal corner-tang forms, but occasionally one is met with that shows an approach to the diagonal corner-tang pieces (figs. 5, Plate I, and 14, Plate IV).

(2) *The Diagonal Corner-tang Knife.*—The diagonal corner-tang knife should be regarded as the standard type for corner-tang pieces, for 50 per cent of all reported specimens belong to this type. It is usually composed of a triangular blade with the tang occupying one of the corners at the base, and with the main axis

of the tang meeting the long axis of the blade at an angle of approximately forty-five degrees (fig. 18, Plate V). The tang placed at this angle would have the effect of elevating the free end of the attached handle considerably above the level of the cutting edge, and this would make the knife more convenient for skinning than would be the case in the hafted base tang knife.

Other forms of diagonal corner-tang knives are illustrated in figures 16, 17 (Plate IV), and 19 (Plate V). Figure 11 (Plate III) shows a small knife from west Texas with the usual heel entirely absent. Good examples of diagonal corner-tang knives with curved blades are presented in figures 9, 15, and 20 (Plates II, IV, and V, respectively). There are some diagonal corner-tang knives which show a peculiarity in construction that is worthy of comment (figs. 12, 13, Plate III). Apparently, the corner of the blade at which the tang is to be located was first truncated before the notches forming the tang were chipped out.

(3) *The Back Corner-tang Knife.*—In this type the tang is still located at or near the corner of the base, but its main axis meets the long axis of the blade at approximately right angles. Four of these knives are illustrated in Plate VI, with the figures arranged in the order of the degree in which they exemplify this type of knife. The specimen at the top of the plate (fig. 22) is only slightly different from the diagonal type of knife. In the next knife (fig. 23) the tang is moved a short distance away from the corner, but is still slightly tilted baseward. The knife shown in figure 24 has the tang extending directly upward, so that its axis is at right angles to the cutting edge of the blade. Finally, the last figure (fig. 25) illustrates the most extreme form of the back corner-tang knife.

The main point of interest in the back corner-tang centers in the possible methods of hafting. If hafted in the usual way, the handle would extend directly upward from the back of the blade. While such a knife might still be used for skinning, it would involve a pushing rather than a pulling movement. It would seem to be also useful as a chopping blade, or as a fleshing knife of the scraper type. A second possible method of hafting such a blade would be to reverse the handle, that is, to insert the blade into a split handle with the tang directed forward and serving as a haft. Fortunately,

there is a record of a specimen hafted in exactly this manner, but it will be considered in a later section on methods of hafting.

(4) *The Mid-back Tang Knife.*—It is possible to show that the mid-back knife is only a specialized form of the corner-tang group. This can be made clear by reference to the series of photographs shown in Plates VII and VIII. It is evident from an examination of the four specimens illustrated in figures 26 and 29 that each knife was fashioned from a triangular piece of flint, and that the tang was then notched at one corner; hence, they represent corner-tang pieces. The knife in figure 26 belongs to the back corner-tang series, but in the other three in succession, the tang is gradually shifted toward the pointed end, until in the last specimen where it is located almost in the middle of the back (fig. 29).

In the development of the mid-back tang piece the elongated blade of the other forms has been transformed into an isosceles triangle, in which the base edge and the back edge form the equal sides of the triangle, and the unequal side represents the cutting edge of the knife. The tang was then worked at the angle formed by the equal sides. Figures 30 and 31 are excellent examples of knives made in this manner.

In this connection we shall refer to a few mid-back tang, scraper-like pieces which have been reported. The few pieces to which we refer are typical scrapers in form, but bear a tang in the middle or non-cutting edge. They have one side flat or concave as in the typical scraper, while the chipping to form the beveled edge is done on the opposite side. Three of these mid-back tang scrapers are illustrated in figures 32, 33 (Plate VIII), and 34 (Plate IX).

(5) *Bifurcated and Two-tang Pieces.*—Two knives bearing bifurcated tangs and three pieces each having two tangs have been reported. Figure 35 illustrates a very fine example of the bifurcated type. The position of the forked tang is the same as that for the back corner-tang pieces. A broken specimen of the same general type is shown in figure 36.

The double tang specimens have two distinct tangs. The one shown in figure 37 (Plate X) is the base fragment of a broken two-tang knife. It has the base tang of an ordinary arrowpoint, and, in addition, a well-worked corner tang at the position of an upper barb. The lower barb is also present. The second specimen (fig.

38) is made of white quartzite, and was found at the lower tip of the Big Bend area in Brewster County. The third specimen (fig. 39) is a miniature knife of toy-like proportions, which was found on the banks of Laguna Madre, Nueces County, by Mr. John B. Dunn of Corpus Christi, who kindly presented it to the author. It is made of the same dull black flint as other artifacts found along this part of the coast and the adjacent islands. It has a typical base tang, and a small additional tang notched in the middle of the back. The rest of the back edge, as well as all of the front edge, is serrated.

The question naturally arises as to what was the purpose of bifurcated and two-tang pieces. It may be suggested that the forked tang might furnish a better anchorage than a single tang for the wooden haft, but it is difficult to see how two distinct tangs would serve any real purpose. Some of the two-tang specimens may represent reworks, in which an extra tang has been notched in one of the edges of a base tang spearhead, thus transforming it into a skinning knife.

(6) *The Reworked Pieces.*—Drills with corner tangs are rather common among corner-tang pieces. They are interpreted as representing reworks, that is, pieces that have been made by rechipping corner-tang knives. The evidence for this interpretation is convincing. In the first place, there is no conceivable advantage in having a corner tang on a drill. They have such tangs for the same reason that many ordinary stone drills show arrowpoint or spearhead tang and barbs, because they have been fashioned out of specimens which originally bore such parts.

In the second place, the character of the chipping shows that the pile of the drill is the product of secondary chipping. This can usually be detected by the unaided eye, but is especially clear when the object is viewed through a binocular microscope. The parts of the knife that have not been reworked show the characteristic original flaking, while on the drill end the secondary chipping is clearly discernible. It is only necessary to call attention to such specimens as are shown in figures 43 and 45 (Plate XI) to demonstrate the correctness of our interpretation. The first of these has the base third left in its original condition, and reveals clearly the primary flaking by which the knife was made, but the other two-thirds has been reworked into a drill that tapers to a point. Note

especially the clearly revealed secondary chipping on the lower side of the pile. The second drill (fig. 45) represents a still more striking case, for the base half of the original knife is left intact, while the distal half has been reworked into a beautiful drill point.

All degrees of reworking are found among the different drills that have been examined. In some of them the entire original knife blade has been reworked almost throughout its entire length (figs. 44, 46, Plate XI). Some of the reworked pieces were obviously made from broken knives. The piece shown in figure 41 has certainly been made from a broken corner-tang knife, and there is a very similar specimen in Dr. Dienst's collection at Temple. Figure 42 illustrates another type of reworked piece, which represents either a small scraper or chisel. Perhaps, some of the longer drills were made from knives with injured edges that made them no longer serviceable as cutting tools. The practice of reworking flint artifacts was very common among the aborigines, and it is undoubtedly true that some of the regular corner-tang knives were made by notching tangs on the common triangular blades which originally did not have tangs.

Most of the reworked pieces described above represent drills rather than awls, because the points of most of them are too thick and blunt to make them effective implements for punching holes in leather or similar materials. Occasionally a reworked specimen has a very sharp point and might have been used as an awl (fig. 40, Plate X). The corner-tang drills, like other stone drills, were probably used for boring holes in shells, wood, stone, and other hard materials.

The Knife Blades.—Up to this point the question of the relation of the tang to the blade has been emphasized, because it was desired to focus attention on the most distinctive structural feature of these knives, namely, the corner tang. The descriptive part of the paper may be concluded with a brief account of some of the variations in shape, size, materials, and workmanship of the blades.

The predominant shape of the blade is triangular, for more than half of the specimens are of this form. The next most common form is the elongated blade (Frontispiece B, figs. 4, 5, 14, 16, 17). A majority of the knives with this form of blade belong to the base corner-tang type, although some of them have the diagonal type of

tang. The distinctly curved type of blade is comparatively rare (figs. 15, 20), but many knives have one edge convex (figs. 4, 5, 9, 14).

The knives vary in length from three-quarters of an inch to nine and one-half inches, with an average length of three and three-quarter inches. The widest knife blade examined measured two and five-eighths inches. The corner-tang artifacts were made of the same materials as that which was used for the construction of the other flint objects that are found on the area over which they occur. Every color and texture of flint is represented among this group of artifacts.

In the matter of workmanship the corner-tang knives are above the average of the other flint artifacts occurring within their distribution area, but they do not exceed in fineness of craftsmanship the better grades of other types of flint knives. A few of these knives may be singled out for further comment. The one shown in figure 15 is an especially well-wrought piece, and is one of the finest of the curved blade type. The perfection of its construction may be emphasized by pointing out that the convex edge, from heel to tip, forms a perfect arc of a circle with a radius of five and one-sixteenth inches. The one illustrated in figure 17 is also a very fine specimen. It is constructed of pure white flint, and this with its graceful lines places it among the finest of the corner-tang knives. Still another excellent knife is shown in Frontispiece B. It is not only the longest of the diagonal corner-tang knives, but is also one of the best in point of workmanship.

These three knives, together with a number of others not shown in the photographs, reveal the art of flint chipping in its highest form. Many of them have been worked to a degree of fineness far beyond the requirements of mere utility, thus demonstrating that the aboriginal craftsman had very considerable artistic ability.

Probable Methods of Hafting Corner-Tang Knives

It was stated in the first part of the paper that the corner-tang knives are blades of handled knives. The reader may be the better able to visualize how these knives looked with handles if diagrams showing the probable method employed in hafting each of the types are introduced at this point. Methods for hafting flint knives with

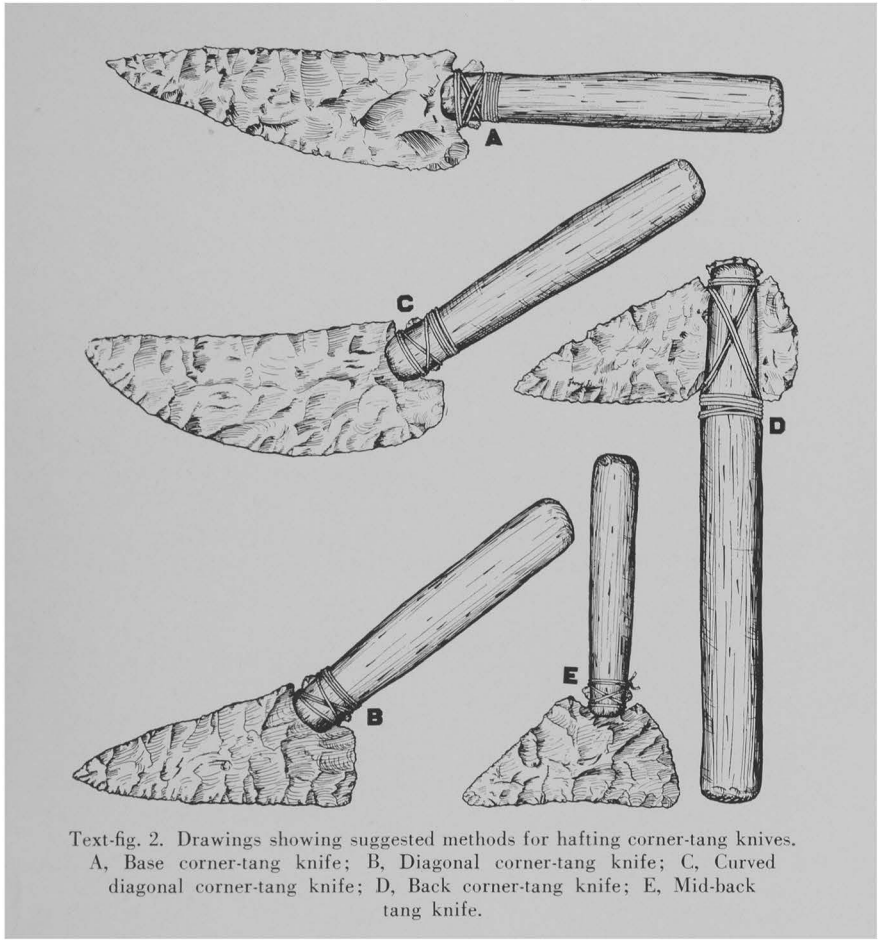
short wooden handles have been described by several different writers. In 1897 Thomas Wilson pointed out that many flint implements, denominated as arrowpoints and spearheads, must have been used as knives, and, if so, they must have been attached to short wooden handles. Unfortunately, through the lapse of time, nearly all of these wooden handles have decayed and are lost. A few, however, have been preserved in protected places, and these, together with specimens belonging to some of the modern tribes, clearly demonstrate how flint knives were hafted by the Indian workman. Wilson cites a number of cases, in some of which the flint blade is inserted in a short wooden handle and fastened with gum, while in others the handle is lashed with cord to the blade.

In 1902 Charles C. Willoughby published a short paper entitled "Prehistoric Hafted Flint Knives," and in this paper he deals with a series of such knives which had been collected from the cliff houses of the Southwest. The wooden handles are well made and the blades are inserted into a deep notch and glued with gum. In a few cases additional security was furnished by windings of sinew or of cord made from the yucca fiber.

The diagrams given in Text-figure 2 are based upon the facts presented in these and other papers on the subject of hafted flint knives. Since practically all corner-tang knives have the notched type of tang, suitable for making the attachment by cord windings, this method of hafting has been used in the diagrams.

Text-figure 2A represents how the base corner-tang knife with a five-inch wooden handle lashed to the tang would appear. It would make an effective implement for many different kinds of cutting. Text-figure 2B gives a good idea of the appearance of the regular diagonal corner-tang knife. Text-figure 2C illustrates the hafted diagonal knife with a curved edge. This would make an excellent knife for skinning.

The only known case of a corner-tang knife with the wooden handle still preserved and intact is one recently described by Dr. W. P. Meroney (1935). The knife, which is of the back corner-tang type, was picked up in eastern Colorado in 1850, after an attack by the Indians on a wagon train. It is now owned by Mr. Frank A. Runkles of Dunlin, Texas. The four and one-half inch blade is inserted in a split oak handle, with the corner tang forward, and lashed with rawhide thongs and strips of sinew. On account



Text-fig. 2. Drawings showing suggested methods for hafting corner-tang knives. A, Base corner-tang knife; B, Diagonal corner-tang knife; C, Curved diagonal corner-tang knife; D, Back corner-tang knife; E, Mid-back tang knife.

of its lightness, Mr. Runkles regards the piece as a "ceremonial tomahawk" rather than as a battle axe.

That the Runkles specimen is not a special case of this method of hafting is indicated by a few back corner-tang knives which have been found in central Texas. The striking feature of these knives is the presence of a notch on the front edge, opposite to the tang on the back edge. One of the best of these was found about twenty years ago by Mr. Rufus King (fig. 21, Plate V). The most logical interpretation of the probable significance of this notch is that it

served as a receptacle for the crotch of the split handle, thus making the hafting of the handle more secure.

It seems to the writer probable that a back corner-tang knife when hafted in the manner of an axe was used as a ripping knife, which could be employed for cutting open the body wall of an animal. It could also be used for skinning or scalping.

Text-figure 2E represents a possible method of hafting the mid-back knives and scrapers. Such an implement would be useful for fleshing hides, and also for skinning when used in a pushing motion.

Geographic Distribution of the Corner-Tang Pieces In Texas

The distribution of these flint artifacts will interest the archaeologist above almost every other known fact concerning them. It was for this reason that efforts were made to obtain as many authentic records as possible. We have available 526 such records; that is, records of pieces the sources of which are known to a degree of accuracy that makes it possible to show their distribution within the limits of the counties of the state. Moreover, the writer knows the exact camp sites from which many of the corner-tang pieces were obtained.

The problem of distribution involves several factors which must be taken into consideration, if correct conclusions are to be drawn from the available data. The varying extent to which different counties have been searched for artifacts would be one important factor. Areas with a dense population and many collectors might very well yield many more records of finds of specimens of a given type than areas with a sparse population and few collectors, although the same number of artifacts might be present in both areas. The success with which one is able to obtain records might readily vary in different areas. Experience has shown this to be true. Finally, the number of aboriginal inhabitants in different areas varied, being dependent upon the climate, soil conditions, water supply, available food, and various other environmental factors, and this would influence the number of artifacts left behind in the different regions.

The writer has taken all of these factors into consideration and believes that the data, although limited, are yet sufficient to give an

accurate picture of the general range of the corner-tang pieces in Texas. Any further attempt to obtain an appreciable increase in the list of recorded specimens would require the impracticable task of a house-to-house census. Furthermore, most of the new records would fall into counties already represented. This is fully shown by the plotting of the specimens as to their sources on a county map of the state. The first 254 records when plotted showed that they had been reported from sixty-two counties. Later, after many efforts were made to extend the range and 272 additional records had been secured, only eight new counties were added, as follows: Gaines, Guadalupe, La Salle, Lubbock, Maverick, and Nueces, each with one record, Dimmit with three, and DeWitt with six records. Finally, it must be kept in mind that we are dealing with the distribution of an artifact that is by no means common, even in the region where it is most numerous.

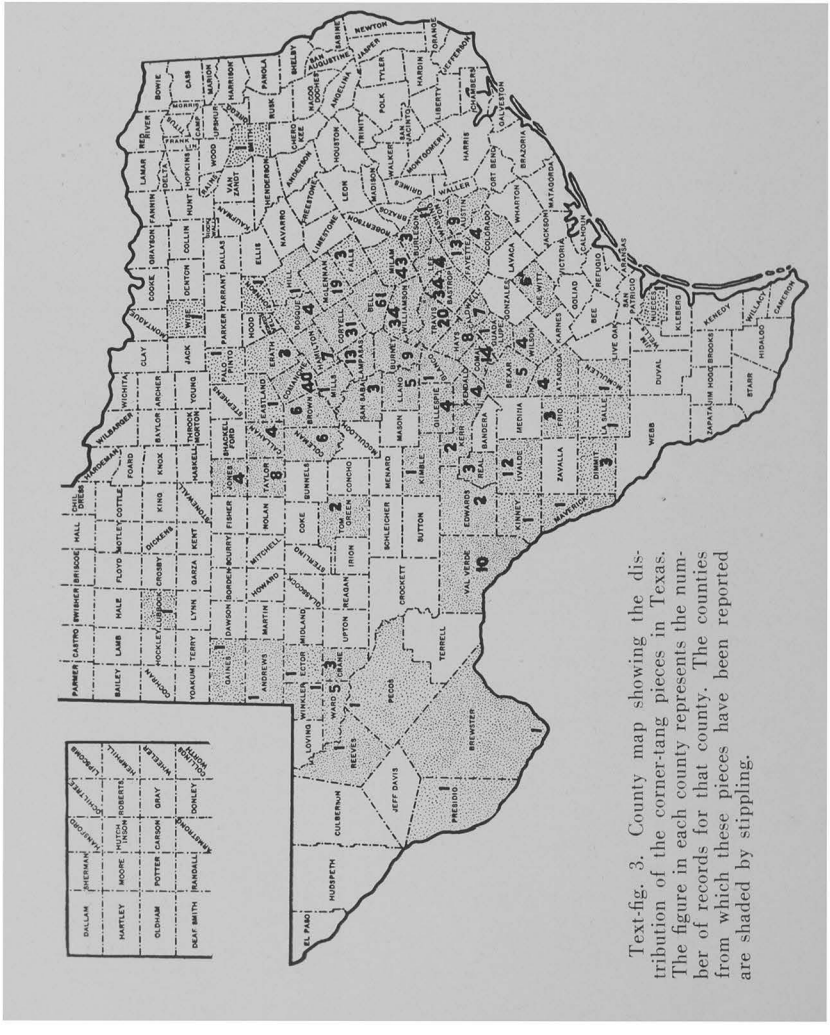
Table I gives the list of counties with the number of recorded corner-tang pieces for each. Bell county with sixty-one leads the

TABLE I. COUNTY DISTRIBUTION OF CORNER-TANG PIECES

County	Number	County	Number	County	Number
Andrews	1	Erath	3	Mills	1
Atascosa	4	Falls	3	Nueces	1
Austin	9	Fayette	13	Palo Pinto	1
Bastrop	34	Frio	3	Pecos	1
Bell	61	Gaines	1	Presidio	1
Bexar	5	Gillespie	4	Real	3
Blanco	1	Guadalupe	1	Reeves	1
Bosque	4	Hays	8	San Saba	3
Brewster	1	Hamilton	7	Smith	1
Brown	6	Hill	1	Taylor	8
Burleson	3	Johnson	1	Tom Green	2
Burnet	9	Jones	4	Travis	20
Caldwell	7	Kendall	4	Uvalde	12
Callahan	4	Kerr	2	Val Verde	10
Coleman	6	Kimble	1	Ward	5
Colorado	4	Kinney	1	Washington	11
Comal	14	Lampasas	13	Williamson	34
Comanche	40	La Salle	1	Wilson	4
Coryell	31	Lee	4	Winkler	1
Crane	3	Llano	5	Wise	1
DeWitt	6	Lubbock	1	County source unknown	7
Dimmit	3	Maverick	1		
Eastland	1	McLennan	19		
Ector	1	McMullen	1		
Edwards	2	Milam	43	Total	533

list, followed by the adjacent county of Milam with forty-three. Then follow in order Comanche (40), Bastrop (34), Williamson (34), Coryell (31), Travis (20), and McLennan (19). There are twenty-four counties each represented by a single record.

Text-figure 3 shows the results of plotting the 526 records on a county map of the state. The figure given in each county represents the number of records for the county. In cases where there is but



Text-fig. 3. County map showing the distribution of the corner-tang pieces in Texas. The figure in each county represents the number of records for that county. The counties from which these pieces have been reported are shaded by stippling.

a single record for the county, the figure 1 is placed as nearly as possible over the reported point of discovery. In order to bring out in sharp relief the area of distribution, the seventy counties involved have all been shaded by stippling.

The map shows clearly that on the basis of our records, the distribution area centers in and about the eight counties named above, with a total "population" of 282 pieces. Eight of the seventy counties gave, therefore, more than 53 per cent of all the records. Surrounding this centrally located group of counties is a series of other counties which yielded much lower numbers of corner-tang pieces. Comal County with fourteen is the next highest, a fact easily explained by the favorable conditions for Indian habitations along the Guadalupe River at or near New Braunfels. The margin of the distribution area is represented, with but very few exceptions, by counties with one or only a small number of records. Beyond these an occasional corner-tang piece is found, representing trade specimens, or else pieces that were carried out from the main center and lost by migrating tribes.

The entire northeastern section of the state has provided but a single record. This specimen was found in Smith County by Mr. P. H. Walser, who sent in the record. The corner-tang artifacts are also very scarce along the Gulf coast. Mr. Sam Chamberlain of Refugio states that so far as his knowledge goes, they do not occur in Refugio County, nor in any of the counties lying to the south of there (he names Aransas, San Patricio, Nueces, Kleberg, Brooks, Kenedy, and Starr Counties). Mr. A. E. Anderson of Brownsville writes that he has never found them in the Lower Rio Grande region. The Department of Anthropology, The University of Texas, has done field work along the coast without finding any corner-tang pieces. The only record from the coast is the one represented by the miniature specimen from Nueces County.

The northern part of the state does not contain many corner-tang artifacts. Most of the collectors from that area state that they do not occur there, or else they are extremely rare. Neither do they occur in the northwestern part of the state, or the Panhandle proper (insert, Text-fig. 3). Mr. Floyd V. Studer of Amarillo has done extensive collecting in this part of the state without finding a single specimen.

The corner-tang pieces seem to be absent or extremely scarce in the area farther south. Professor W. C. Holden of Lubbock reports a single specimen, owned by Mr. W. G. McMillan of Lubbock. It is the base end of a broken knife that was found in a grave located seven miles southeast of Lubbock, on Yellowhouse Canyon. It was associated with a piece of black on red Pueblo pottery, as classified by Dr. H. P. Mera of Santa Fe, who states that this type of pottery was in vogue about 1300 A. D. Dr. Holden's tracing shows that the piece represents a weak type of base corner-tang knife.

About a dozen specimens have been reported from that region of west Texas which lies near the southeastern corner of New Mexico. A majority of these pieces have been found among the well-known sand hills of that area. South of this territory, and west of the Pecos River, they are evidently very rare. Professor Victor J. Smith of Alpine states that their museum has data on 230 sites located in the Big Bend area, but he does not recall having found a single specimen of this type.

Directly south of the central area of distribution the number of records gradually falls off until only a few scattered cases are found at the southern margin. To the southwest of the central area, however, a comparatively large number of corner-tang pieces have been found, in fact, more than the map indicates. We have been unable to secure authentic records of some of the specimens that are known to have been found in this region. A personal visit to this territory brought out the fact that several discovered specimens had been sold to commercial buyers, and it was not possible to trace them back to their original sources.

Perhaps a word should be added about the possibility of their occurrence in the territories surrounding Texas. There are two authentic records from Oklahoma, for one of which the writer has the specimen. A few have been found in Colorado (e.g., the Runkles specimen). There are no records either for Old Mexico or New Mexico. Their occurrence in such counties as Maverick, Kinney, and especially Val Verde, would lead one to suspect that a few may be found across the Rio Grande River in Old Mexico, and their presence in Texas near the corner of New Mexico, would also lead one

to suspect that they may occur in the southeastern corner of that state.

Table II lists all of the specimens in which it was possible to determine the type to which they belong. In some of the drills the work of rechipping had so modified the original relation of the tang to the blade as to make their classification uncertain. The first five columns of figures lists 450 specimens, including such drills as could be safely classified, while the last column lists all

TABLE II. DIFFERENT TYPES OF CORNER-TANG PIECES

	Base C.T.	Diag. C.T.	Back C.T.	Mid-back T.	Double T.	Drills
Number	70	225	136	14	5	53
Per cent	15.6	50.0	30.2	3.1	1.1	9.9

of the drills found among the total of 533 specimens. The diagonal type includes one-half of the classified specimens, with a percentage of 50. The back corner-tang type is the next most common, with a percentage of 30.2. Then follow in order the base corner-tang type with 15.6, the mid-back tang type with 3.1, and the rare double-tang types with 1.1. The fifty-three drills out of 533 specimens give a percentage of 9.9.

The final point of interest on distribution has reference to the number of records for individual camp sites. The records show that any number of camp sites have yielded two or more corner-tang pieces. There are five outstanding cases, as follows: (1) the Gault mound, located at the head waters of Salado Creek in Bell County, has produced five records; (2) the Department of Anthropology, The University of Texas, in a partial excavation of a rock shelter, located in Seminole Canyon, Val Verde County, obtained four corner-tang pieces (Pearce and Jackson, 1933); (3) the D. W. Anderson mound in Williamson County, six miles west of Round Rock, shows five records; (4) the Hog Island camp site near Cameron, Milam County, has given six records; and (5) the Clear Fork Creek camp site situated about two miles west of Lockhart, Caldwell County, has also given six records. Undoubtedly other specimens of which we have no record have been found on these same camp sites. In this connection there should be mentioned the excellent discovery of Mrs. Alex. Dienst in 1930 of a

cache of four fine specimens on Donoho Creek, in the southeastern corner of Bell County.

When Were the Corner-Tang Artifacts Developed and Used?

We may be expected to say something about the probable "age" of the corner-tang pieces. In the present state of knowledge concerning central Texas archaeology it is impossible to give a definite answer to this question.

Any attempt to determine the age of the central Texas flint artifacts is met with almost insurmountable difficulties. As Thomas has stated, the heavy rainfall over this region, coupled with the open and exposed condition of the camp sites and mounds, has resulted in the loss by decay of practically all associated objects of a perishable character (quoted by Pearce and Jackson, 1933, p. 140). Such wooden objects as posts and beams are entirely gone, and consequently the tree ring method for determining archaeological dates cannot be employed.

The burnt rock mounds, or kitchen middens, of central Texas offer some evidence worth considering. While most of the corner-tang artifacts have been found on the surface of camp sites located in cultivated fields, yet a number of them have been obtained from excavations of the kitchen middens. Some of the records of such recovered specimens are sufficiently accurate to justify citations. The little knife shown in Figure 13 was found by Mr. Barrow in the Fate Barker mound at a depth of twelve inches. Mr. A. T. Jackson obtained a corner-tang piece at a depth of seventeen inches in excavating the Rogers Spring mound, located six miles northwest of Austin in Travis County. Mr. S. L. Woolford of Austin reports the discovery of two corner-tang knives in kitchen middens; one at a depth of three feet in the D. W. Anderson mound on Brushy Creek in Williamson County, and the other at about four feet in a mound located two miles east of Hye in Blanco County. Mr. Emory Doss found a very fine curved corner-tang knife at a depth of three feet while excavating for a cellar near Gay Hill in Milam County. There are several other reliable records, but these references will be sufficient to show that the corner-tang pieces are present in the kitchen middens of central Texas, and that

some of them occur at a considerable depth and unassociated with white artifacts.

From the evidence obtained from the burnt rock mounds, we may now turn to that which has been secured in excavations of the deposits in the rock shelters of Val Verde County. The Department of Anthropology of The University of Texas found four corner-tang specimens while excavating a trench through the deposit of one of the rock shelters in Seminole Canyon. One of these was found at a depth of three feet. Only a small part of this extremely large shelter was excavated, and it is safe to assume that had the entire deposit been worked, a much larger number of these artifacts would have been recovered.

The bearing of these facts on the antiquity of the corner-tang pieces will depend upon the dates assigned to the kitchen middens and rock shelter deposits by the archaeologists. Concerning the rock shelters, Professor Pearce makes the following statement: "The culture is that of a modified late Basket Maker type and probably came down to historical times. No traces of white contacts were found, and no traces of pottery or corn culture were encountered." (Pearce and Jackson, 1933, Preface.) As Sayles (1935, p. 124) points out in his Archaeological Survey of Texas, the Texas horizons of culture have not been dated, "except by cross-finds of pottery associated with the El Paso and Panhandle phases."

Pearce (1932) has pointed out that the kitchen middens of central Texas show three levels of occupation, which he calls the Upper, Middle, and Bottom levels. These are recognized by differences in the contained artifacts. Sayles identifies these levels with three of his own phases. Both writers agree that certain artifacts are common to the cave deposits and the kitchen middens, and among these artifacts are the corner-tang pieces.

The corner-tang pieces have been found at a depth which would place them in the middle level of the burnt rock mounds. The deposits in both types of habitation undoubtedly extend well back into prehistoric times. The corner-tang knives must therefore have been developed before the coming of the white man.

According to Sayles, the Tonkawan tribe, which the early explorers found occupying central Texas, represents remnants of

once more numerous tribes who made the kitchen middens found throughout the Edwards Plateau region. The Apache tribes are known to have occupied the west Texas area for a period extending back into prehistoric times. But various other tribes occupied the area over which the corner-tang pieces are found, so that any further discussion of possible associations of these artifacts with definite tribes would seem to be unprofitable.

Summary and Conclusions

In approaching the problem of the origin of the corner-tang knives one may assume that these artifacts did not spring into existence with the suddenness of a biological mutation, but, like all human implements, were gradually developed from some basic tool, which in turn had been perfected throughout the ages of man's history. A study of these artifacts supports this assumption, and indicates that the basic implement from which they were developed was the common spearhead type of knife. The first indication of their origin is detectable in those flint knives in which the tang occupies a slightly eccentric position, instead of the usual central location, on the base end of the blade. Further shifting of the tang toward one of the two main edges of the blade ultimately resulted in the production of a knife with the tang located at the exact corner. This represents what we have called the diagonal corner-tang knife. That it constitutes an implement of great utilitarian value is attested to by the fact that 50 per cent of all corner-tang pieces are of this design. Such an artifact represents a skinning knife *par excellence.*

Specialized formes of corner-tang pieces were also developed, and two of these types are especially interesting. The back corner-tang knife represents but a slight modification of the diagonal type. Nevertheless, the location of the tang on the back edge created a knife that by other modes of hafting could be used for purposes distinctly different from that for which the diagonal type was employed. The mid-back type represents a still greater specialization of the generalized corner-tang knife. From its form and structure it would seem to be better adapted as a scraper for dressing hides than as a cutting tool.

The corner-tang pieces must have arisen during prehistoric times in response to a desire to have a more convenient knife. They were doubtless used for more than a single purpose, just as any modern tool is employed for several different functions. These knives could scarcely have been developed by an agricultural people, but must have originated among tribes who lived mainly by hunting. In brief, the corner-tang artifacts represent implements associated with the chase.

This conclusion is not only justified by the designs of these pieces, but it is also supported by the facts of their distribution. The map of distribution shows clearly that the corner-tang artifacts were developed and used in central Texas. The main line of their distribution follows in general the course of the Balcones Fault Line. The Cretaceous exposures throughout this region furnished an abundant supply of fine flint from which to fashion stone implements, and the many large springs along the fault line supplied the necessary water for numerous Indian habitations. Coupled with these advantages was the presence of large herds of game animals, which roamed over this territory even after the beginning of historical times. It is not surprising, then, to find artifacts in this area which reflect the hunter's type of life.

From the main area in central Texas the corner-tang artifacts spread out in various directions, especially toward the southwest. The number already reported from Val Verde County indicates that they must have been rather common in that area. The group from the sand hills in and about Monahans can best be explained on the basis of the relation of this area to that of Val Verde County. The Pecos River flows between these two areas, and it must have formed a natural migration route which was traveled back and forth by the inhabitants of the two regions, and thus have given opportunity for the corner-tang pieces to have found their way into the extreme western part of the state.

We do not know just what tribe or tribes made these artifacts. Nor do we know just when they were originated, except that the evidence strongly indicates that they were developed during prehistoric times. Once developed they must have been used by succeeding generations of aborigines, even well into modern times.

The incident relative to the discovery of the Runkles specimen is proof of this statement. In conclusion, it may be suggested that the corner-tang artifacts represented a distinct cultural element in the lives of the tribes who made and used them, and it is for this reason that they constitute objects worthy of careful study.

ACKNOWLEDGMENTS

Throughout the course of this study more than two hundred persons have in one way or another given valuable assistance and information. It is not feasible to name all of these individually, but the writer wishes to take this opportunity of expressing to all of them his appreciation for their help and coöperation. Acknowledgements are especially due to those who have loaned specimens for illustrative purposes. Credit for these will be found in the descriptions of the figures.

The writer is under heavy obligations to Professor J. E. Pearce for his fine coöperation. All of the facilities of the Anthropology Museum, of which he is director, were made available. His careful editing of the manuscript is especially appreciated. Thanks are also due Mr. A. T. Jackson, Mrs. Mildred P. Mayhall, and Mrs. Helen D. Barnard, all of the Anthropology Department, for much valuable help. Finally, the writer is under obligation to Dr. Frederick McAllister and Dr. Leta Henderson of the Department of Botany, for the use of certain photographic facilities, and to Mr. George H. Mickey of the Zoology Department, for the drawings shown in Text-figure 2.

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Plate I

NOTE.—Unless otherwise indicated, all figures in the plates are reproduced at natural size. Where ownership is not given, the specimens illustrated are in the private collection of the author, and are designated by their catalogue numbers.

Fig. 1. Curved knife of the simple base tang type. Found about three miles east of Austin, some thirty years ago, on Claus Sjoberg farm. × 5/7. No. 4361.

Fig. 2. Base tang knife with convex cutting edge, from A. W. Jarmon farm near Salome, Williamson County. × 5/7. No. 1839.

Fig. 3. Curved base tang knife, from the Wade farm, three miles north of Elgin, Bastrop County. × 5/7. No. 2592.

Fig. 4. A typical base corner-tang knife, uncovered by road grader on road adjacent to the Batt Lane farm five miles south of Elgin, Bastrop County. × 5/7. No. 4203.

Fig. 5. A base corner-tang knife with tang tilted upward, from Burnet County. × 5/7. Robert Lytton, Austin.

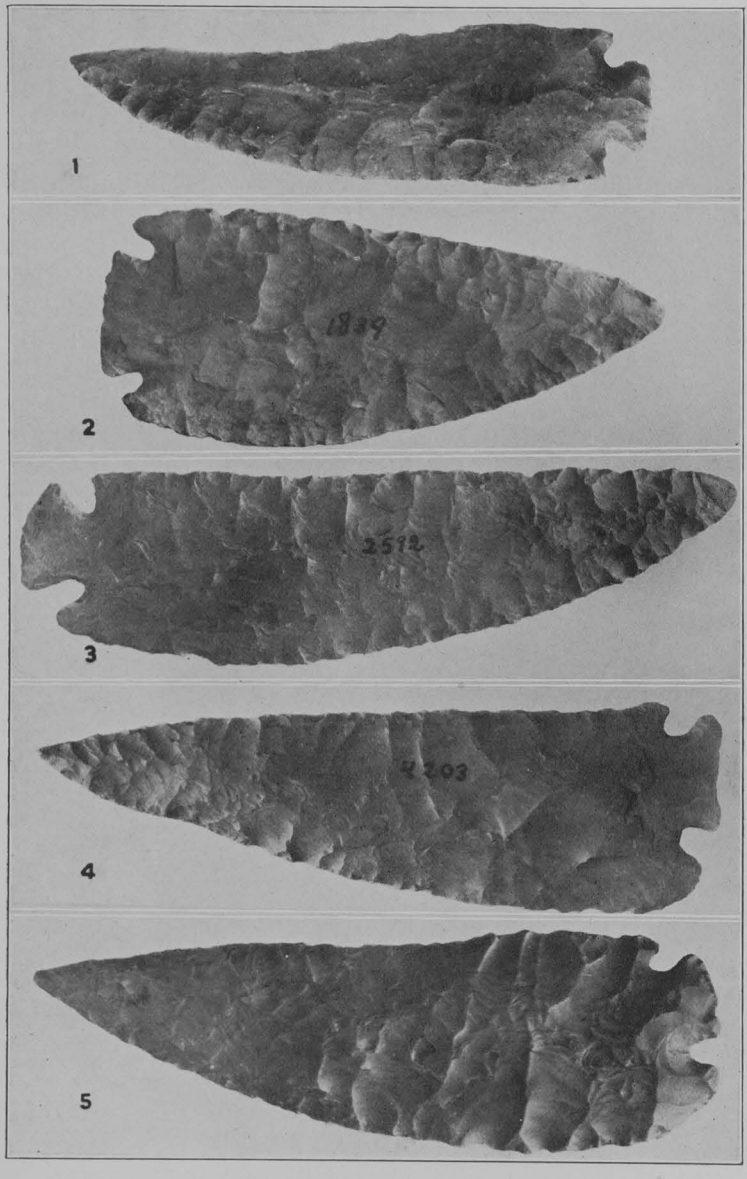
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Plate II

Fig. 6. A simple tanged knife found near Elgin, Bastrop County. No. 5027.

Fig. 7. A base corner-tang knife from Clear Fork Creek, two miles west of Lockhart, Caldwell County. No. 4204.

Fig. 8. A base corner-tang knife from Black Fish Lake, Burleson County. No. 411.

Fig. 9. A diagonal corner-tang knife from Stag Creek near Sidney, Comanche County. No. 6249.

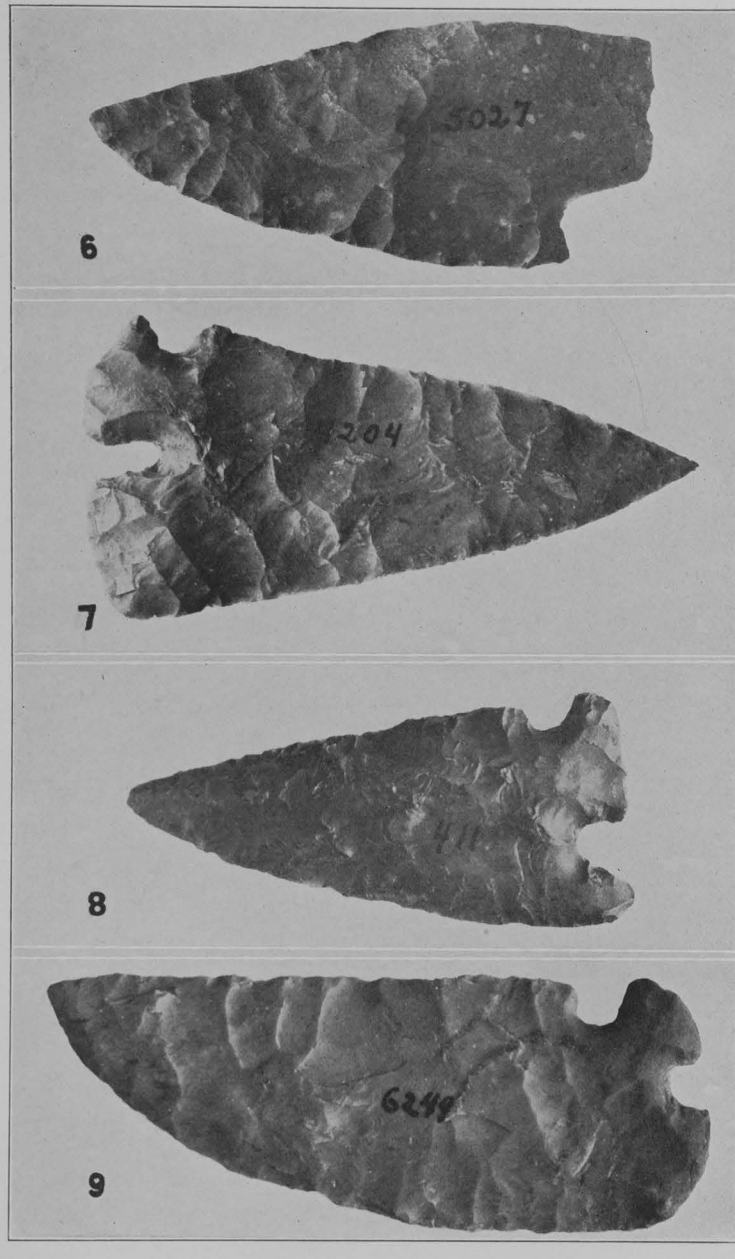
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Plate III

Fig. 10. A base corner tang from about nine miles north of Columbus, Colorado County. No. 6359.

Fig. 11. A diagonal corner-tang knife without heel, from northwest corner of Andrews County. No. 6307.

Fig. 12. A truncated diagonal corner-tang knife, excavated at twelve inches in the Fate Barker Mound, Bear Creek, Travis County. D. B. Barrow, Austin.

Fig. 13. A truncated diagonal corner-tang knife from Tradinghouse Creek, McLennan County. Frank H. Watt, Waco.

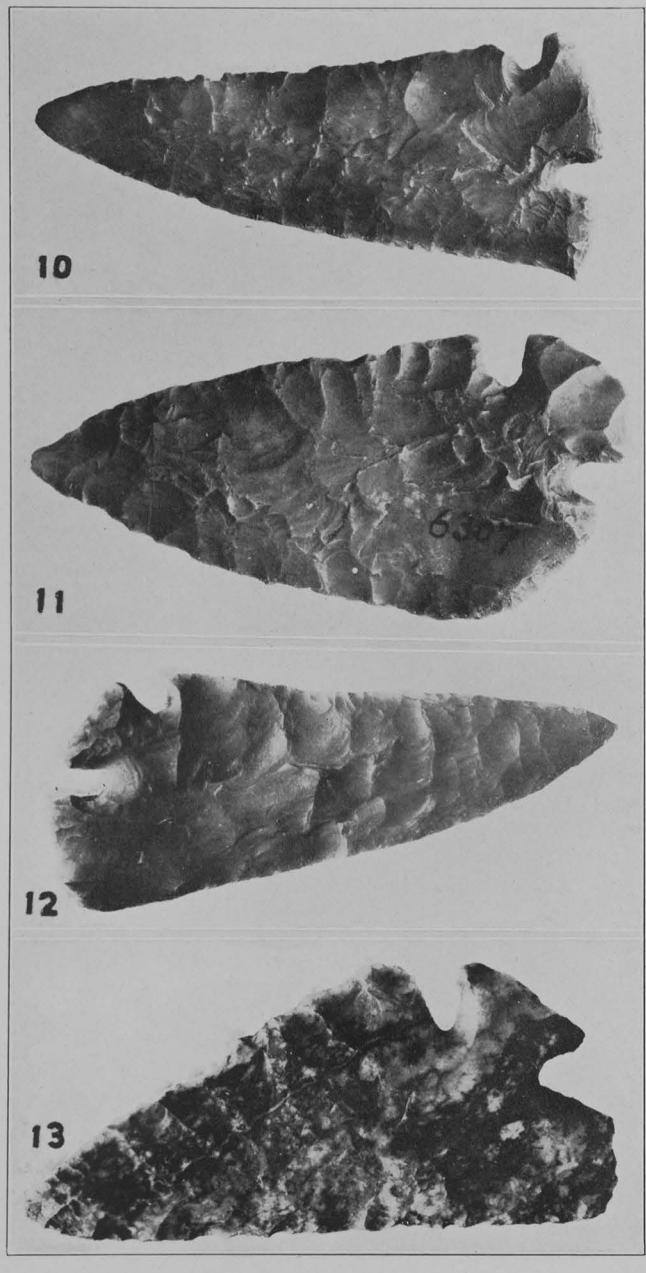
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Plate IV

Fig. 14. A base corner-tang knife with tang tilted upward, from Mrs. E. A. Doss farm, Gay Hill, Milam County. × 5/6. No. 6310.

Fig. 15. A curved diagonal corner-tang knife from A. J. Goats farm, Brown County. × 5/6. Anthropology Museum, The University of Texas, Austin.

Fig. 16. A diagonal corner-tang knife from San Gabriel River, San Gabriel, Milam County. × 5/6. No. 6314.

Fig. 17. A diagonal corner-tang knife from about nine miles north of Columbus, Colorado County. × 5/6. No. 6358.

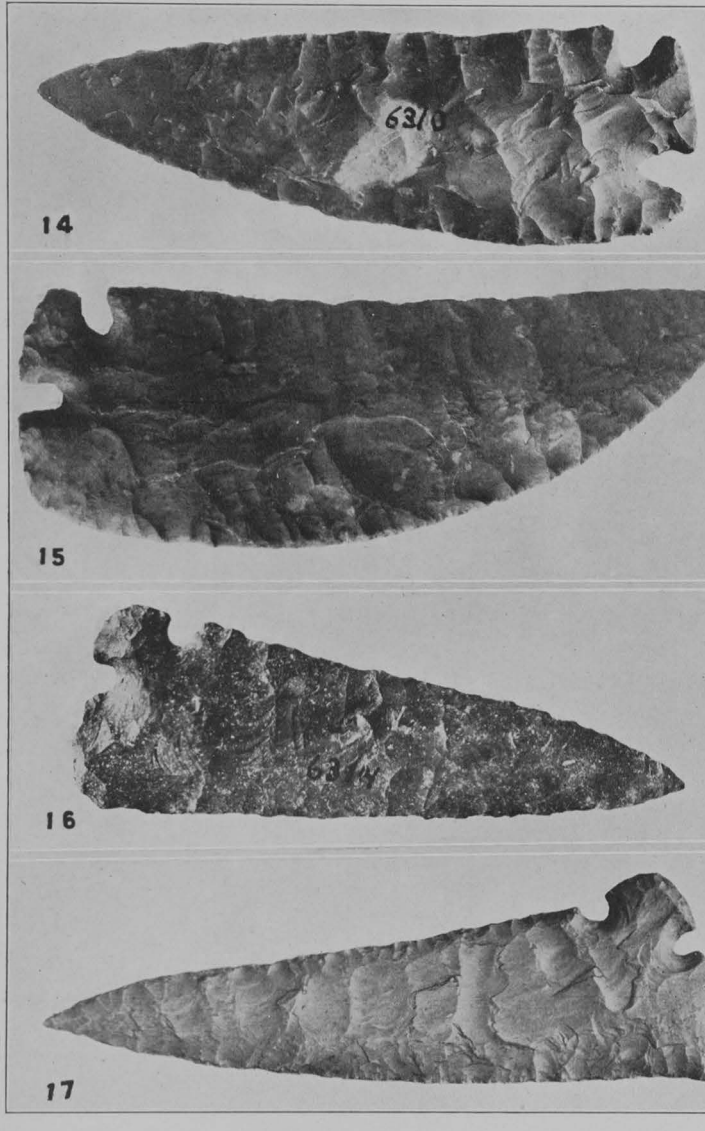
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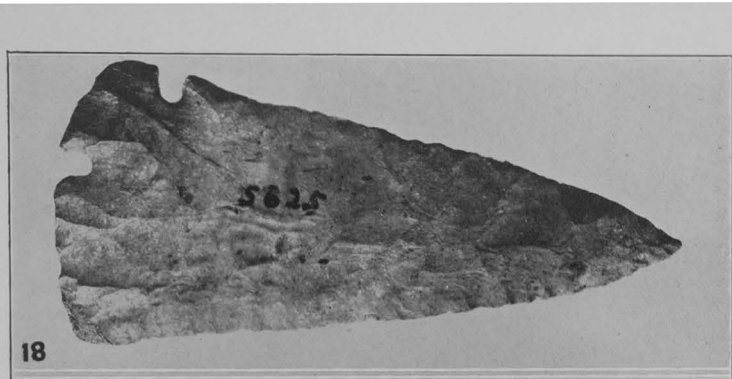
Plate V

Fig. 18. A diagonal corner-tang knife, from Smithville, Bastrop County. × 9/11. No. 5625.

Fig. 19. A diagonal corner-tang knife found near Elgin, Bastrop County. × 9/11. No. 4585.

Fig. 20. A curved diagonal corner-tang knife, Travis County. × 9/11. Robert Lytton, Austin.

Fig. 21. A back corner-tang knife with crescent notch found by Mr. Rufus King on Little Walnut Creek, Travis County. × 9/11. Boy Scout Headquarters, Austin.



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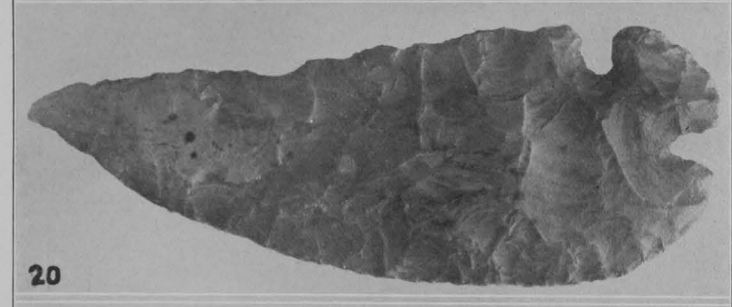

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Plate VI

Fig. 22. A back corner-tang knife from Cummings Creek, Fayette County. × 9/10. No. 6226.

Fig. 23. A back corner-tang knife from Brown County. Anthropology Museum, The University of Texas, Austin. × 9/10.

Fig. 24. A back corner-tang knife from near Cameron, Milam County. C. R. Granberry, Austin. × 9/10.

Fig. 25. A back corner-tang knife from Elm Creek, near Temple, Bell County. Alex. Dienst, Temple. × 9/10.

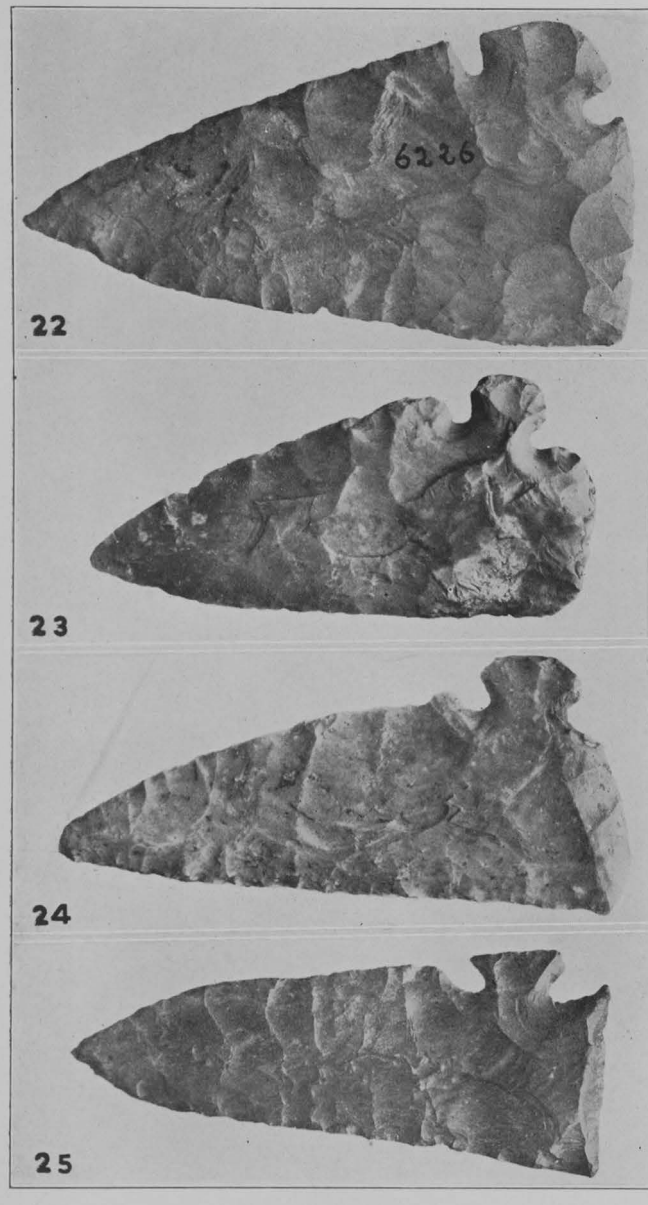
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Plate VII

Fig. 26. A back corner-tang knife from Brushy Creek near Taylor, Williamson County. No. 6308. × 7/8.

Fig. 27. A back corner-tang knife from Koenig farm on Wilbarger Creek, Bastrop County. No. 5026. × 7/8.

Fig. 28. A mid-back tang knife from the San Gabriel River near Leander, Williamson County. No. 4202. × 7/8.

Fig. 29. A mid-back tang knife from Brown County. Anthropology Museum, The University of Texas, Austin. × 7/8.

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Plate VIII

Fig. 30. A mid-back tang knife from Brown County. W. P. Meroney, Waco.

Fig. 31. A mid-back tang knife found near Thrall, Williamson County. Anthropology Museum, The University of Texas, Austin.

Fig. 32. A crude mid-back tang scraper from Travis County. No. 6254.

Fig. 33. A mid-back tang scraper from Cowhouse Creek, Hamilton County. Frank H. Watt, Waco.

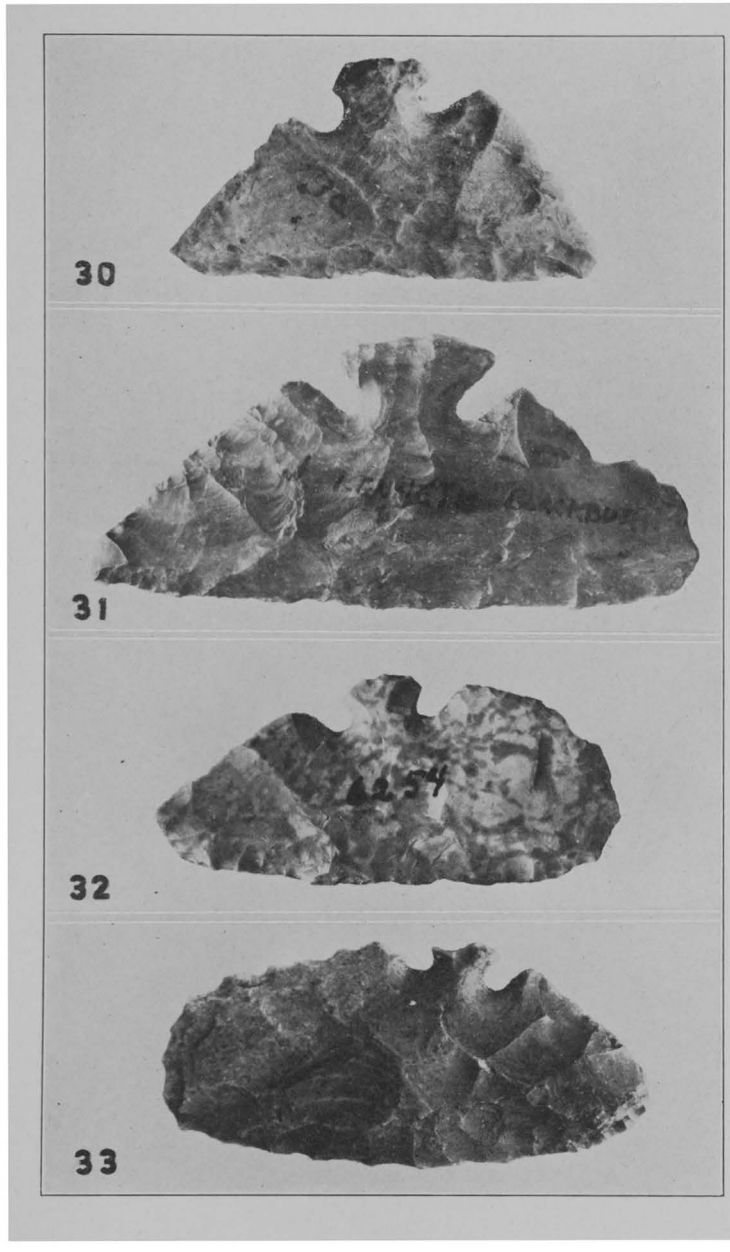
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Plate IX

Fig. 34. A mid-back tang scraper, from Alum Creek, Bastrop County. W. A. Fiegel, Austin.

Fig. 35. A bifurcated tang knife from Hunter's Bend, Travis County. W. A. Fiegel, Austin.

Fig. 36. A broken bifurcated tang knife from Brushy Creek near Hutto, Williamson County. No. 6173.

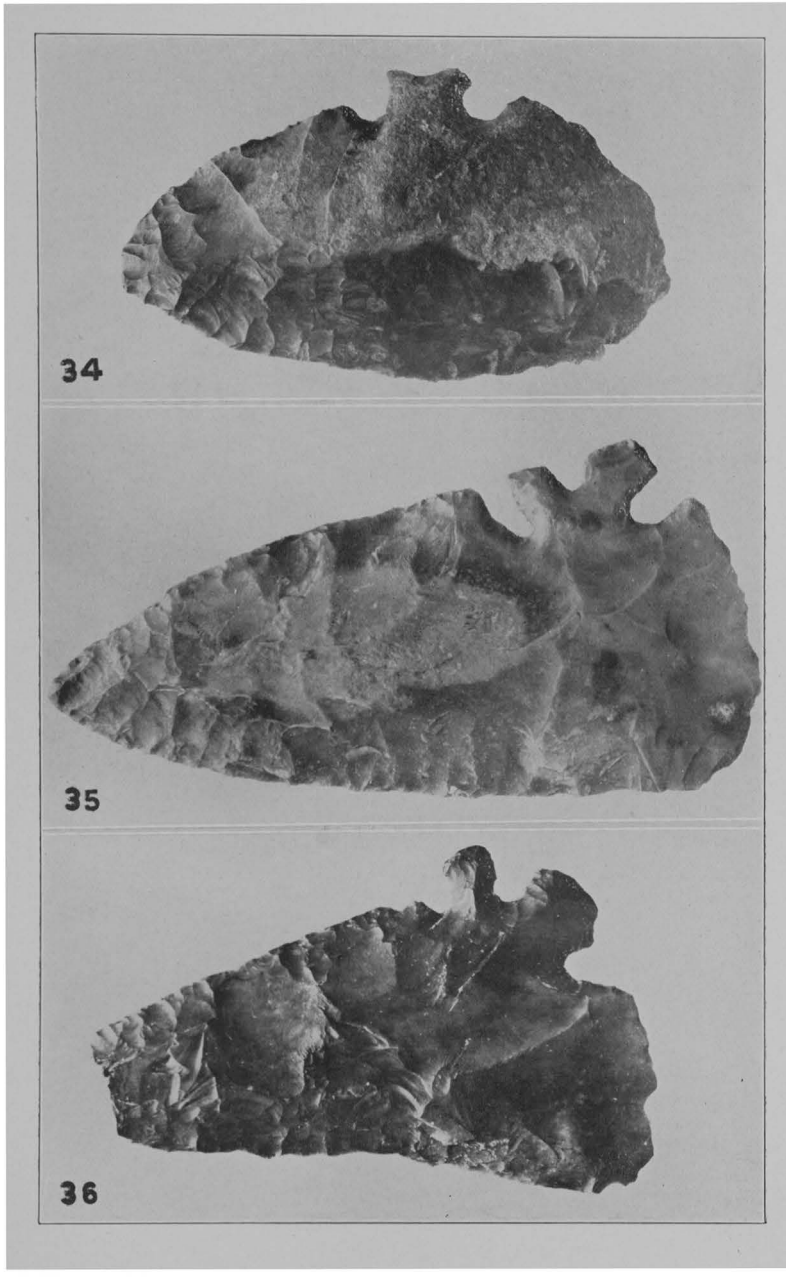
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Plate X

Fig. 37. The base fragment of a broken two-tang knife, from the C. A. Doss farm, Gay Hill, Milam County. No. 6313.

Fig. 38. A two-tang knife from the lower tip of the Big Bend, Brewster County. Anthropology Museum, The University of Texas, Austin.

Fig. 39. A miniature two-tang piece from Nueces County. No. 6377.

Fig. 40. A corner-tang drill from the George Begg farm, mouth of Onion Creek, Travis County. No. 6253.

Fig. 41. A small punch made from a broken corner-tang knife, from near Elgin, Bastrop County. No. 4849.

Fig. 42. A small scraper made from a broken corner-tang knife, found near Junction, Kimble County. No. 5014.

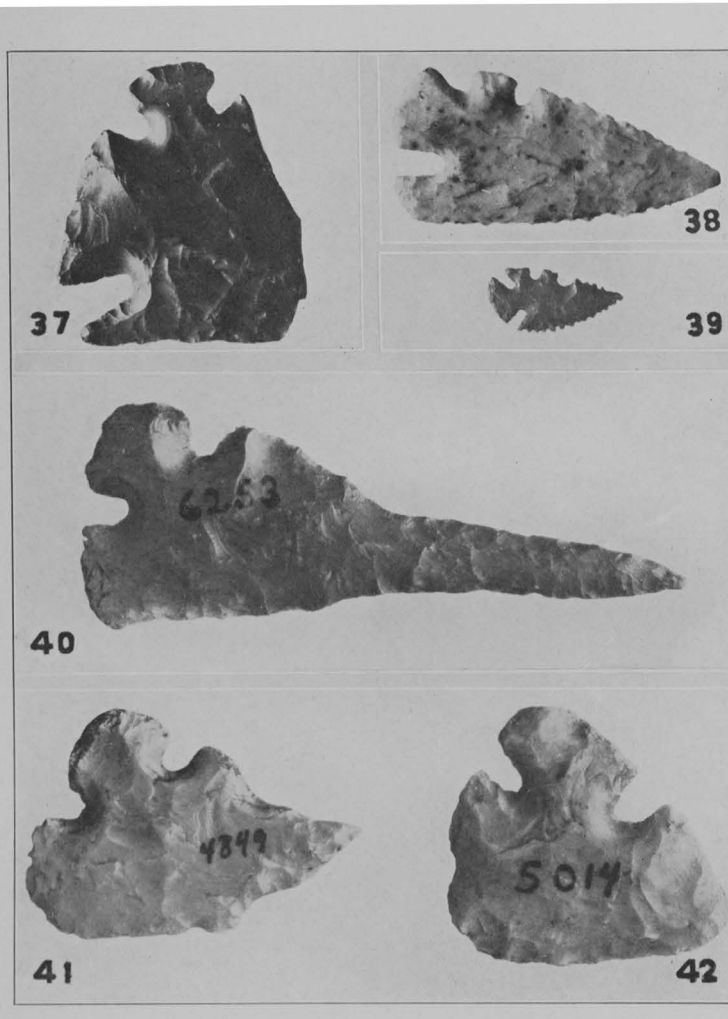
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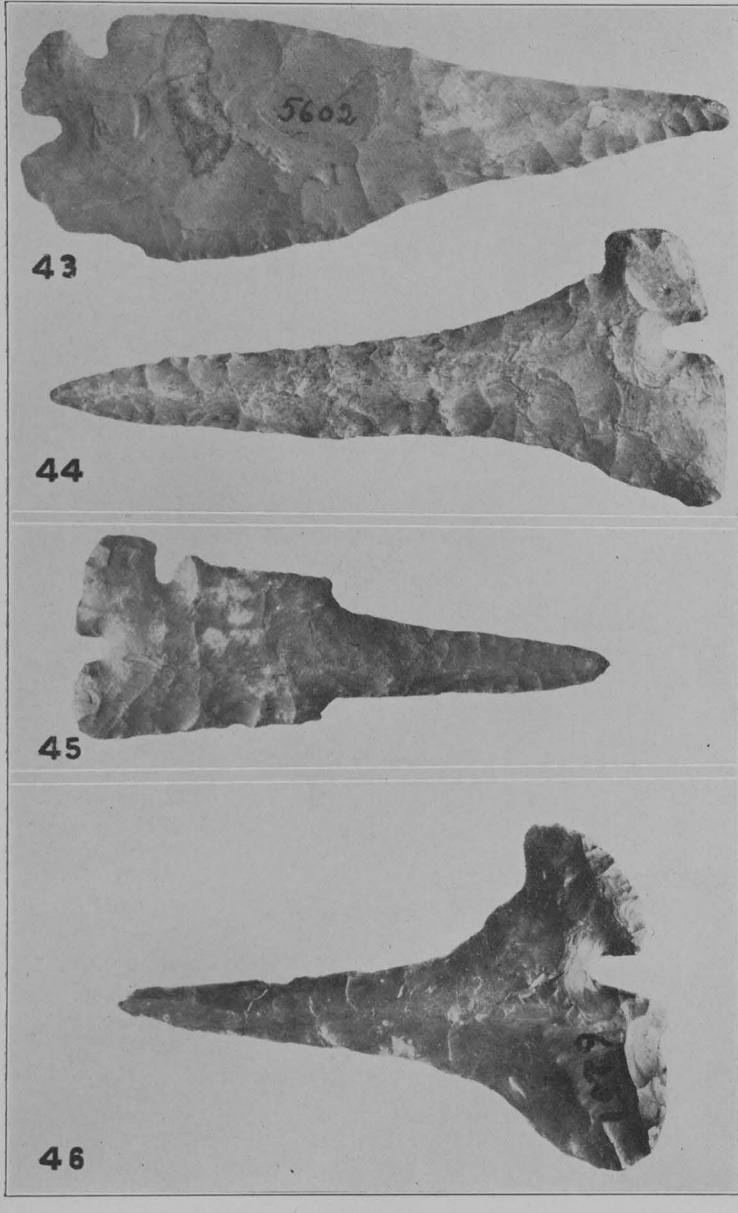
Plate XI

Fig. 43. A corner-tang drill from the Burleson farm near Deatsville, Travis County. No. 5602.

Fig. 44. A corner-tang drill from Rockdale, Milam County. R. W. Aldrich, Austin.

Fig. 45. A corner-tang drill from Bell County. Alex. Dienst, Temple.

Fig. 46. A corner-tang drill from Uvalde, Uvalde County. No. 6251.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